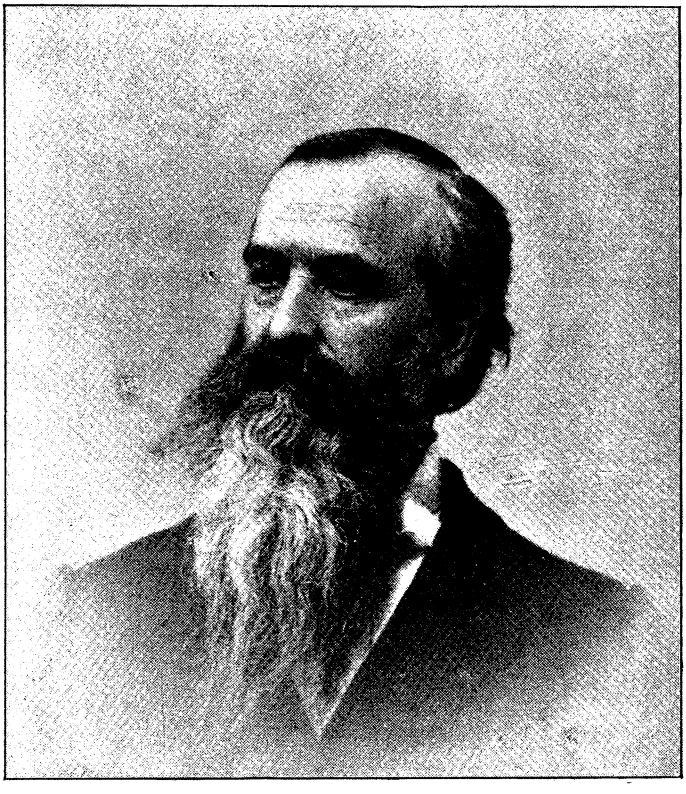


J. A. FOLLETT, M. D.,

DEAN OF BOSTON DENTAL COLLEGE.

ITEMS OF INTEREST.

VOL. XI. PHILADELPHIA, JUNE, 1889. No. 6.

Hots from the Profession.

THE INTERNATIONAL DENTAL CONGRESS.

[Translated for the ITEMS OF INTEREST by "Mrs. M. W. I."]

Arrangements for the coming International Dental Congress are being rapidly perfected, through the joint labors of the "Committee of Organization," which was appointed on the 4th of December," 1888, by the Minister of Commerce, who is the Governor-General of the Universal Exposition, under the auspicies of which the Congress will be held.

The Committee has organized the following Bureau:

President.—M. Th. David, Physician and Dental Surgeon of the Hospital of Paris.

Vice-Presidents.—MM. Brasseur * and Saussim, Physicians of the Faculty of Paris, the first Director of the second Professor in the Dental School of France.

General Secretary.—M. Pourchet, Physician of the Faculty of Paris and Professor in the Dental School of France.

Treasurer.—M. Kühn, Physician of the Faculty of Paris, Doctor of the Faculty of Burxelles.

The Committee have just issued a circular addressed to the President of all properly organized Dental Societies, the world over, of which we translate portions, as follows:

The object contemplated by the Odontological Society of France, and the Odontological Society of Paris, in the organization of the International Dental Congress, is to make known the progress of Odontological Science, contributing to its further development by the discussion of various questions pertaining to dental art.

Dental societies are cordially urged to further the objects of the Congress by sending delegates in person, or papers to be read before the Congress.

Names of delegates should be sent in as soon as possible; also the name of a Corresponding Secretary for the local society.

* Died in January.

The General Secretary should be informed, at least two months before the opening date of the Congress, of all papers to be sent, such notification to be accompanied by a brief abstract of the paper, giving the *argument* and *conclusions*, in as few words as possible (the abstract in all cases to be written *in French*, whatever the language of the essay itself may be). This abstract, either in full or abbreviated, will be included in the programs to be sent one month in advance to all delegates whose names have been forwarded to the General Secretary,

M. M. F. P. Pourchet, 24 Rue de la Chausie d'Antin, Paris, France,

To whom all communications relative to the Congress should be addressed.

The Congress will open on Sunday, September 1, 1889, and last one week.

The opening and closing sessions will be held at the Exposition, at the Trocadero.

Scientific sessions will be held at the rooms of the two Odontological Societies, 57 Rue Rochechouart, and 3 Rue de l'Abbaye.

Clinics at the operating rooms of the Dental School of France and the Dental School of Paris.

The Congress will be divided into four sections :

1st. Anatomy and Physiology : Normal and Pathological.

2d. Operative Dentistry: Special Therapeutics and Materia Medica.

3d. Prosthetic and Orthopedic Dentistry.

4th. Deontology and Dental Education.

The subject to be discussed will be classified as:

1st. Those chosen by the Committee of Organization.

2d. Voluntary.

They will comprise first essay in French, English, German, Italian or Spanish; all conclusions being announced *in French.*

3d. The discussion.

4th. Practical demonstrations—operations in operative or prosthetic dentistry, and the exhibition of new instruments and appliances.

Those requiring space for illustrations, apparatus or other accessories, should signify this as early as possible.

Essays will be limited to fifteen minutes, which at the pleasure of the President may be extended to twenty. Any further extension of time is subject to the vote of those present.

In the discussion, each speaker will be allowed five minutes—to be extended to ten with the permission of the President.

No speaker can occupy the floor more than ten minutes in the discussion of any subject, without the permission of those present.

Those desiring to participate in the discussion of the subjects announced in the program, as the regular order of the day, will be called in order, by notifying the Secretary General beforehand, in writing.

Anything which shall be published, except by authority of the Congress, within less than three months after the adjournment of the Congress, will appear only by title in the volume of transactions.

While desiring communications on all subjects pretaining to the science or the art of dentistry, the Committee beg to direct the attention of the members of the Congress to the following topics to which will be given priority in the order of the day. It is specially desired that those who may have made special study of these questions, in original investigations, should make public their views on this occasion.

SECTION I.—*Anatomy and Physiology, Normal and Pathological.*

1st. The teeth in connection with the race-question.

2d. The "rôle" of micro-organisms in dental and oral pathology.

3d. The influence of nutrition in the causation and the cure of dental caries.

4th. Dental and oral classification and terminology.

SECTION II.—*Operative and Therapeutic Dentistry.*

1st. The treatment of teeth with diseased pulps and with dead pulps.

2d. The comparative value of gold and of the plastics in tooth-preservation, with an exposition of recent progress in this line.

3d. Local anesthesia.

SECTION III.—*Dental Prosthesis and Orthopedy.*

1st. Indications and procedure in crown and bridge-work.

2d. Irregularities of the teeth and dental arches, with an exposition of the newest methods of treatment.

3d. The choice of material for the construction of the prosthetic apparatus.

4th. Restoration of the face and of the maxillaries.

SECTION IV.—*Deontology and Hygiene.*

1st. Education in the art of dentistry; methods; length of courses.

2d. Dental and oral hygiene during the period of dentition.

Papers received before the first of July will be printed and distributed in advance, so that all may be prepared to take part intelligently in the discussions.

Everything is being done to make the meeting profitable to all, and the number of visiting dentists will doubtless be very large.

ALPHABET OF HINTS.

Amalgo-gold fillings. Steurer's plastic gold, worked into the surface of a soft amalgum-filling, in large proximal cavities, gives the appearance and edge-strength of gold, with the care of manipulation of gold. —*D. M. Clapp.*

Antipyrine, administered internally, produces a passive discoloration of the teeth, especially if the enamel is abraded; rubbing with peroxide of hydrogen removes the discoloration. —*Galippe.*

Bichloride of mercury, carried past a gold filling in a mouth which becomes an inert fluid, being decomposed by electrolysis and the free mercury deposited on the filling. —*C. J. Essig.*

Bonwill's crowns are best set in a combination of oxyphosphate and amalgam, till the crown with amalgam and the canal with the mixture. —*H. B. Filison.*

Carbolic acid, one tablespoonful to a quart of hot water, makes a 3 per cent solution suitable for the disinfection of instruments.
—*L. A. King.*

Crimped pellets or pads of tin-foil will remove all scars of mercury from amalgam fillings.— x x

Disinfect root canals with corrosive sublimate, five grains to the ounce, the strength recommended by *J. J. R. Patrick.*

Disinfecting compound for office or sick-room:

Oil Rosemary	10 parts
" Lavender	2 parts
" Thyme	2½ parts

Mix and to 30 parts add 1½ part nitric acid.
Evaporate from a sponge.

Eroded and rusted instruments can be easily restored by immersing all night in a saturated solution of chloride of tin. Rinse and rub with chamois.

Ether applied externally in front of and about the lobe of the ear will, it is claimed, anesthetize the trifacial nerve sufficiently to permit painless tooth extraction.

First of all, learn the battery, is *Dr. Creager's* advice to all contemplating the use of the electric mallet.

File and scrape your celluloid blank to the form of your pattern. You can press it in five minutes, and have it come out ready for the mouth. —*Seabury.*

Cinacol will disinfect a root canal, even if left sealed up in it for two or three months—*Harlan.*

Gum-colored porcelain, inlaid in the necks of anterior teeth, is an artistic idea developed by *Dr. A. H. Thompson.*

Hot melted sulphur is used by *Dr. Horace Dean*, in the treatment of inflamed obscured roots, doing away with all other medicaments or disinfectants. Also as an element in crown work.

Herbst's small partial plates, without impression. Press a piece of rubber into the mouth, trim it, set the teeth on it, try in, and vulcanize. —*Dr. George.*

In drilling sockets for implantation, have the chips to form nuclei of bone corpuscles, starting the growth of new bone tissue. —*H. M. Fletcher.*

In 1686 Thos. Budman replanted teeth, filling the root canals with gold or lead. —*H. A. Smith.*

Jeweler's broaches are readily converted into superior dental broaches by dipping them in sperm oil and burning it off, laying them on a sheet of tin or brass. —*D. B. Freeman.*

Jumping toothache, is due to a dying pulp, confined without vent. Expansion of gases in the closed chamber causes pressure on the living portion. —*Ingersoll.*

Keep muriate of cocaine in one-grain packages, and for each operation make a fresh solution, using ½ grain to 20 drops distilled water. —*Hugenschmidt.*

Keep your gutta-percha under salt water, and it will remain good for many years. Eighteen, asserted by *Dr. Flagg.*

Lacto-peptine will digest minute portions of pulp tissue in root canals. —*Ingersoll.*

Low brass, such as is used in making cheap jewelry, makes excellent flexible disks. —*Barker.*

Melted sulphur, as a lining in shallow cavities, secures a good degree of adhesion of gold to tooth-substance, where under-cuts are inadmissable. —*Dean.*

Moussete's pills:—One-fifth milligram aconite and five centigram quinine are a valuable anti-neuralgic remedy, put up in Paris.

Nitrous oxide gas aggravates diabetes, producing "an irritable shower of sugar in the blood. —*C. N. Peirce.*

Neuralgia is alleviated by the extract of white poppies, a sedative but not a soporific. —*Genese.*

Oxycyanide of mercury, as an antiseptic, is less irritant than sub-

limate, and is less readily absorbed; on suppurating surfaces it is readily tolerated, and attacks instruments but slightly.

One ounce of chloride of zinc crystals, costing twenty-five cents, to which add water to make a saturated solution; add one ounce oxide of zinc, costing five cents, and you have the quantity of zinc which would cost you five dollars at your dental depot. —*Cormany.*

Phosphate of lime, in the magma state, is used by *Dr. Cravense* as a root-filling in deciduous teeth.

Piano-wire, filed gradually as it binds in exploring a root-canal, makes the best broach, following curves and reaching the apex without passing through side-walls. —*Wooley.*

Quill-caps, with oxyphosphate filling, enables *Dr. Gilmer* to cap exposed pulps successfully.

Quillaya bark has been found of value in the removal of pathogenic matter from the nose, in catarrh.

Rubber handles, with steel shanks, have been advantageously substituted for solid steel pluggers, with the electric mallet.—*Dr. Creager.*

Repair cracks or torn places in rubber articles with the following cement:

Sulphide Carbon,	16 parts
Gutta-Percha,	2 parts
India-Rubber,	4 parts
Fish Glue,	1 part

Draw together with stitches, if necessary, and apply several coats.

Shellac Wheels:

Shellac,	16	pulverized
Corundum,	84	

Mixed, warmed, pressed. —*Mage.*

Sulphite of soda, ½ oz., in the cuspador, before using, and acetic acid, ¼ oz., added just before emptying, will, by the liberation of free sulphurous acid gas, destroy bacilli and lessen the danger of infection from tuberculous patients, etc. —*W. S. Smith.*

To move obstinate teeth in regulating. Drill away the resisting alveolar wall, carefully avoiding the periosteum. —*H. A. Smith.*

Ten per cent silica added to gold, will make it melt over the flame of a common candle.

Under cuts. In making dies, cores for under cuts in models may be made by mixing dry 10 per cent common flour with 90 per cent molding sand. Moisten more freely than for sand alone.

—*Bujwid.*

Uncle *Jerry Robinson* bathes aching, inflamed pulps of deciduous teeth with chloroform and caps at once with oxyphosphate mixed with carbolic acid.

Varnishing cavities with a thin solution of common "rosin" in chloroform makes gutta-percha fillings water tight.—*I. L. Williams.*

Very large cavities, in frail teeth, may be filled with oxyphosphate with a surface cap of gold plate, bevelled like a screw-head, the under side roughened to hold the cement. —*S. B. Palmer.*

When a pulp is exposed from attrition or fracture, with no cavity of retention, shape a small concave hat of wax, to hold the devitalizing paste.—*W. E. Barrett.*

Witzell's rolls of cotton wrapt in ribbed absorbent paper, are handy for damming back saliva.—*xx.*

Xylite is obtained from pyroxylic spirit.—*xx.*

Yellow-wash is made by adding 2 grains of corrosive sublimate to an onnce of lime water.—*Ex.*

Zinc phosphate and amalgam combined form a plastic filling which possesses all of the most desirable properties of each of these materials, and eliminates the objectionable properties of both.—*H. B. Telchon.*

EXTRACTING TEETH A MAL-PRACTICE.

DR. J. MARSH, CHICAGO.

Nine-tenths of all teeth and firm roots can be saved by immediate filling. As Dr. Atkinson says, "I do not believe in killing babies for the sake of having a funeral." I believe, with a correct diagnosis, a dentist can tell whether a pulp can be capt without pain or lingering death. Rather than severe pain or probable death, I would remove and fill roots at once; now the trying part is to open the pulp chamber, so as to get in direct contact; never go around a corner. Go direct through crowns of bicuspids, molars, palatal surfaces of incisors and cuspids. Sometimes it may be necessary to use an anesthetic to open up the pulp chamber. There need be little pain in extirpating the pulp. Use willow or orange-wood, bamboo or hickory if you can get it green, and keep it from getting dry and brittle, whittle to a point, dip in carbolic acid, and with one firm blow drive it into the root. Prepare several points and while your point is anesthetized; operate quickly. You cannot always accomplish the removal of all the pulp with wood points. You want your broaches ready. There is none better than those made of piano wire filed to different sizes. If you do not put them in the fire they will seldom break. Have some with fine hooks, but mostly stright, fine and coarse. Have your varnish ready and carbolic bottles open. Dip the smooth nerve broach in

the varnish. Wind a fine fibre of cotton around it and then it will be sure to stick. Dip in carbolic acid and run the broach into the root, beside the pulp, turning it around, which will be most likely to remove the pulp. If not, keep on trying with different sized broaches. When you renew the cotton be sure your broach is dry before you dip in varnish. Then put on the rubber dam. Clean and dry thoroughly and fill, using gutta-percha dissolved in chloroform to the consistency of thin cream, pumping to the ends of the roots, using gutta-percha points and making sure that you fill thoroughly, and you can tell by the slight pain it gives the patient. I have treated hundreds of teeth in this way. My own daughter had the pulps of two teeth removed, one lateral and one cuspid. They were thus treated, and filled and crowned at one sitting, without the least pain after. Mrs. B. had four teeth cut off. The pulps removed, filled and crowned the same afternoon, and has had no soreness or pain since. I can give names and addresses of many such.

I treat dead teeth and roots by putting on the dam. Place carbolic acid, ninty-five per cent, clean out the decay and open the pulp chamber, removing all over hanging-walls, being careful not to drill through between the roots. Then drop peroxide of hydrogen with syringe, and work it into the roots with broach, removing all dead pulp. Wind cotton around your broach, and pump as long as it foams. Then add carbolic acid with fibres on your broach with peroxide of hydrogen till there is no sign of pus. Dry thoroughly, use extract of eucalyptus or carbolic acid. I have used all sorts of remedies. The main thing is to thoroughly cleanse and disinfect. Then dry and fill the same as when you have removed a live or congested pulp. Often you will find a small part of pulp very painful. Wash out all you can, wind your broach, dip in carbolic acid; go for it, and you will soon settle it.

In blind abscess or with fistula, I use as the last resort aromatic sulp. acid in the cavity; let it run through the root, and also syringe into the fistula.

Let any dentist who is accustomed to do all his excavating with the engine go carefully over all the surfaces of a cavity that is supposed to be ready for the introduction of the filling, and he will often be very much surprised at finding softened dentine where he had supposed it all removed, and he will, perhaps, have made clear to his apprehension the cause for certain hitherto inexplicable failures. Use the engine by all means, but not without the aid of the exploratory excavator.—*Dr. W. C. Barrett.*

THE NECESSITY OF A THOROUGH KNOWLEDGE OF MECHANICAL DENTISTRY.

G. W. CUPIT, D. D. S., PHILADELPHIA.

When a young man intends to make dentistry his life work, he should study beforehand the best possible way to become one of the most successful in that calling. What better way has he to do this than to select a few of the most prominent men in the profession, and by inquiry (which any conservative worker will only be too willing to give) ascertain the way they prepared themselves for their successful career. If we look back at their beginning in professional life, we will find, in nearly every instance, it began with an apprenticeship in a mechanical laboratory, and after careful drilling at the science and practice of mechanics, their minds have been broadened and their skill sharpened, so that it is easy to grasp the more theoretical college studies.

The master mechanic of any trade has always come from the work shop; and the most able in the profession are those who have a complete knowledge of mechanical dentistry, and who cannot only direct to the best results in prosthetics, but who can work out those results, tho, from a press of operative dentistry; or from a dislike for the more uncleanly laboratory work, prefers to employ a mechanic to do it for them. Many poorly fitting plates, and poorer arrangements of teeth, from lack of proper knowledge and skill, fail to give life-like naturalness. It is a luxury to see nature really imitated by art, but which so few artificial teeth possess.

Too often, students have little practical knowledge when they obtain their degree. We need a more thorough course of studies, and that course to consist not only of a knowledge of filling a tooth, but the scientific principles and practical skill of filling a tooth, and a knowledge of the principles to scientifically restore contour, not only of a tooth, but of a face and an expression. This is where we often find a lack of proper knowledge and practical skill. There is too much skimming over the surface, and not enough of that deep, conscientious working-out of principle, and knowing what we do is as good as can be done.

Nearly all operations in the mouth, except those treated surgically, are based on the same mechanical principles which are taught in the laboratory. In our success as operators, there depends so much on our thorough knowledge of mechanical principles developed in prosthetic dentistry we should make the foundation for our work broad and deep, that we may have a larger and more perfect superstructure. In this way, we should make this branch of our profession as honorable and as successful as operative dentistry.

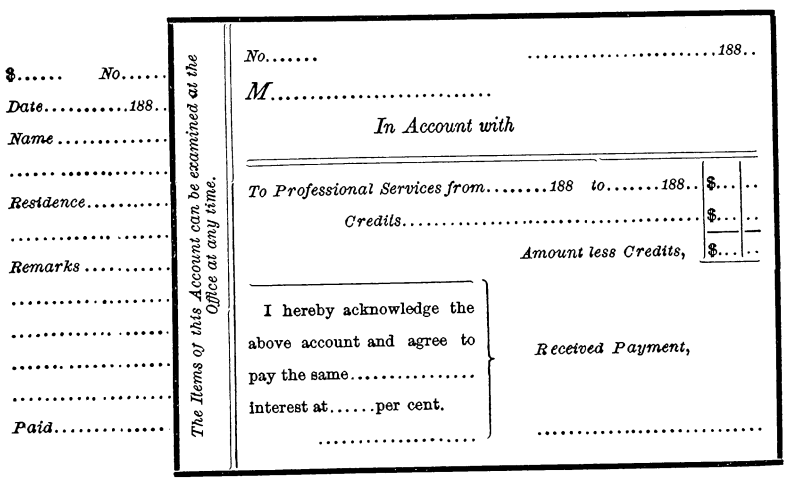
BE PROMPT AND SYSTEMATIC.

DR. WM. H. STEELE, FOREST CITY, IOWA.

I noticed an article in one of our dental journals a short time ago in which the statement was made that dentists as a class are poor business men. I am sorry to say I believe there is much truth in it. Tho it will apply to many in other businesses. Accounts being kept in a slipshod way, they are never presented till necessities seem to demand money. No one can expect to do business in that way and retain the credit or patronage of people.

Conduct your business on purely business principles; give your patients faithful service, so that you can conscientiously feel you have earned your pay. Always charge a fixed price for your work, and never try to gain practice by making charges below reasonable prices. Render your bill as soon as your work is completed, or at least the first of each month, and be in earnest when you commence to collect it. If you put off the presentation of your bill for a long time, the patient will always be surprised at the amount, and will often imagine your services worth less than your charge. In dealing with country patients, or anyone who wishes time, settle up with them when the work is done, fill out an acknowledged blank account for the amount due you, have the patients sign it, and kindly give them to understand you expect it to be paid when due.

The following is the form I have used for the last seven years:



$..... No.....
Date.....188..
Name.....
.....
Residence.....
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Remarks.....
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.....
.....
Paid.....

The Items of this Account can be examined at the Office at any time.

No..... .....188..

M.....

In Account with

To Professional Services from.....188 to.....188.. $... ..

Credits..... $... ..

Amount less Credits, $... ..

I hereby acknowledge the above account and agree to pay the same..... interest at.....per cent.

.....

Received Payment,

.....

Lack of system in business means growing embarrassments, and subservience to petty cares, which leave less room for study, improvement and pleasure. It also keeps one in constant worry, and causes a drain on vitality, and so injurious to health and longevity.

GERMINAL MATTER AS FOOD.

J. F. SANBORN, M.D.

When we consider the various substances used as food, drink, or condiments, just to please the taste, we are not surprised at the number of diseases to which the flesh is heir to, and the question naturally arises, how much of the aches and pains, sickness and premature deaths may be placed to the credit of these gustatory gratifications? To keep good time, a watch must have the best of care; our bodies are as delicate machines as a watch, and demand as constant care to keep them in good condition; the less the vitality has to contend with, all other things being equal, the longer life and health may be enjoyed.

The old adage, "They that dance must pay for the music," is just as true in matters of "how we live" as in how we dance; so to avoid sickness, pain, and misery, and have long life, crowned with health, happiness, and usefulness, we must observe the "laws of life."

It is said, the unwise gustatory indulgence of our first parents brought death, and we do not profit on their example, but too often invite the penalty of violated law, which is sickness, pain, and premature death. Is it then not a laudable inquiry, what part of our food is really utilized in building our tissues, to subserve the life and health-giving purposes?

We see that matter occupies four planes. First, the lowest is chemical elements, as carbon, hydrogen, oxygen, and nitrogen; the next, or second plane, is chemical stable compounds, as carbonic dioxide, water and ammonia; the third is vegetable proximate principles, as starch, sugar, and gluten; the fourth and highest plane consists of animal tissues, as muscle and adipose tissue. The elements have such an affinity for each other, that they unite two or more to form stable compounds, and are in a state of equilibrium, so that with the exception of the nitrogen and oxygen as they constitute the air, matter is seldom found in the elementary condition. The cycle of matter to become animal tissue is from plane 2, as stable compounds, to plane 3 as vegetable proximate principles, as starch, sugar, and gluten; and from plane 3 to plane 4, as animal tissues, as muscle, nerve, vein, or artery. This is as high as it can go; from plane 4 it may fall back to plane 2, where it started. In the decay of all organic matter, be it vegetable or animal structure, their substance falls back to plane 2 as stable compounds. All matter on becoming organized into either animal or vegetable structure, takes the form of cells, and has received its first initiatory impulse to life motion from pre-existing living structure. The seed that is sown for the future crop has a life force within itself to start life motion in the plant, wherever placed under favorable cir-

cumstances. In the animal kingdom the egg is the germ, from which the future animal is to be started in life.

The contents of the egg, and also of the seed, are known as germinal matter. The egg is neither bone, flesh, vein, or artery, but it is that from which all these are formed. The grain of wheat is quite different from the roots, stalk, or leaves, yet they were started on their life work by the life force existing in the germ.

The chicken is quite in contrast with the rudimentary cell structure of the egg from which it was hatched; and if examined under the microscope it will be found composed of cells in accordance with all other organic structure. The external part of the cells constitutes the tissue, as a muscle; and a nucleus in each cell, out of which the tissues are organized, just as truly as the chick is developed from the egg. This nucleus then bears the relationship to the rest of the cell, that the egg bears to the chick; and for this reason may be termed the germ of the tissue cell. This is so in all animal tissue.

In vegetation, the seed is the germ, just as truly as the egg in animals; and the nucleus of the vegetable cell is analogous to the nucleus in the animal cell, and known as protoplasm, and is the material out of which the vegetation tissues are formed. Beale tells us that the nucleus of the animal cell is called bioplasm, and is so like vegetable protoplasm as not to be distinguished from it. The part of the cell external to the nucleus is called, by Beale, "formed matter." This formed matter of the cells is developed from the bioplasm in animal tissues, and protoplasm in vegetable cells, so that this formed matter was once germinal, either as bioplasm or protoplasm, the formed matter is a step further in advance in the cycle of development.

In all animal life the nucleus of the cells is where the life force changes the unorganized bioplasm into organized tissue.

All multiplication of the cells is by the division of the nuclei of pre-existing cells. In animal tissue all wounds are healed by the leucocytes of the blood, which are floating bioplasts, and out of which new granulations are formed. In all traumatic lesions, except those healed by first intention, the edges of the wound are removed and new tissue formed from germinal matter, be it leucocytes or bioplastic, or both working in harmony; in other words, a wound is never healed by formed matter of the cell walls. The reason is, the formed matter is always further on in its cycle of development than is bioplasm, which is essential to tissue building, be it in nourishing old cells or forming new ones.

In food we have formed matter, as in potatoes, parsnips, cabbage and other vegetables; in fruit, as apples, or flesh, as lean muscle tissue; and we have also in them the protoplasm and bioplasm which are not

yet developed into tissue, as formed matter. We have also seeds of vegetables, and eggs of fowls that are nearly all germinal matter, that is, matter not yet developed into tissue.

In the seeds and eggs there is but a very small proportion of formed matter, as compared with vegetables proper, or the flesh of animals, and for this reason they are so much more nourishing in proportion to their quantity used as food. We see then in both the animal and vegetable kingdoms, that matter becomes germinal as bioplasm or protoplasm before it becomes cell tissue, because the formed matter is more advanced in the development than the germinal.

When Hezekiah, King of Judah, was sick, in answer to his prayer, the prophet Isaiah was commanded to return and inform the king that fifteen years should be added to his life, the king asked for a sign; "Isaiah said, shall the shadow go forward ten degrees, or go back ten degrees? And Hezekiah answered: It is a light thing for the shadow to go forward ten degrees; nay, but let the shadow go back ten degrees." II Kings xx, 9–10.

It is so with organic matter; it is a small thing for the bioplasm in the animal cell to advance ten degrees in its natural cycle to become organized into tissue, as formed matter; but when it returns from formed matter as found in the food eaten, to became germinal matter, as bioplasm, it is like the shadow on the dial of Ahaz, going back ten degrees, and will require a special exhibition of Divine power.

Take a lock of hay, can it become food for vegetation without going onward in its course and decaying, so as to become stable compounds, and again start on its way and become protoplasm? When it has gone through this process, then it may become vegetable structure in accordance with nature's law of organic development.

If this is the law of growth in the vegetable kingdom, how is it with the formed matter in animal cells? Can it turn back in its course of development, and by a process of digestion be so rejuvinated as to become bioplasm, and a second time become formed matter, as tissue?

It is easy to understand how the bioplasm of the animal cell as germinal matter can be digested, absorbed and become bioplasm, and then be organized into tissue, as formed matter; but how formed matter can return in the cycle of its course, so as to become bioplasm and not be like the shadow on the dial of Ahaz, when it returned ten degrees, is hot so apparent.

Formed matter of our food may subserve a useful purpose, as straw is fed to stall-fed animals to serve a mechanical use to distend the abdominal walls; but further than this we think it has no use.

Food to be assimilated must consist of that represented by

germinal matter of seeds, nuts, the protoplasm of vegetables, and in animal kingdom by the egg, milk and bioplastic matter.

These are all on the upward and onward part of the cycle of their development, and may become tissue; but all that is formed matter, after it has subserved its mechanical use, is rejected. The process of cooking does not necessarily impair the nourishing properties of germinal matter; while fermentation and decay destroys all the life-giving properties.

This is taking advanced grounds to any found in the books; it is no more so than the legitimate deductions will warrant; and did we live up to these conclusions we should use only such food as the vital machinery is designed to utilize; then we should emancipate ourselves from our slavery to unphysiological habits and abnormal desires; then, we should enjoy better health, and there would be less friction in the life activities; less aches and disease, therefore more happiness and ability for usefulness up to a ripe old age.

THE TOOTH PULP AS A GANGLION.

LECTURE BY DEAN INGERSOLL.—AN INTERESTING STATEMENT.

In this day of *saving teeth*, when that is the main object for which the dental profession exists, it is highly important that we understand the structure of the teeth and the methods for preserving them, and adopt such as will accomplish the purpose with as little damage as possible. We have to deal with two living tissues—the peridental membrane, and that mass of living substance known as the dental pulp. I have for many years felt that our nomenclature was extremely unfortunate in calling this structure a *pulp*. The ancients, when they began the study of the teeth, found in the central cavity this soft mass, and it seemed to them only a something to keep the teeth from drying, corresponding, as they thought, to the marrow of bones. I remember when I began the study of dentistry it was a common thing for a patient to say, you are in the marrow, when pain was experienced. They called the pulp the marrow of the tooth.

Now we say here is the dentine, here the enamel and here the pulp of the tooth. Then we are accustomed to say dentine is composed of both animal and mineral tissue—animal about 25 per cent. and mineral about 75 per cent. differing, with the age of the patient. We say that the animal tissue of the dentine is composed of fibres passing entirely through it from the central chamber to the peripheral. These we call *dental fibres*, identifying these fibres as a part of the structure, and the whole profession regard them as part of the dentine; they are known by no other name. In all our literature, we call them *dentinal fibrils*.

Thus we associate this living portion with the dentine. When a patient comes in with a cavity to be filled, the dentist begins his operation and his patient cries out, you are right in on the pulp—right on the nerve; it hurts. No, sir, says the dentist, I am nowhere near the pulp, it is only *sensitive dentine*. I know you are on the pulp, replies the patient, I know you are, because it feels so. Oh, no, no sir, you need not be afraid at all, it is simply *sensitive dentine*, not the nerve that I am touching. After four, five or six months the patient comes back and says, my tooth is sensitive . I can not take cold water, it is sensitive to heat and cold and it hurts, what shall I do? We must do something. The pain goes on from week to week and from month to month, and finally the dentist says, I will extripate the pulp. He drills a hole right through the pulp chamber and extracts the contents and says, now I have extracted the pulp.

When a man attempts to extract the pulp, how much of it does he get? He gets just the central part, and what becomes of these fibres of the pulp? They are broken off. A large part of it must be left in the dentine—the so-called dentinal fibrils. The dentist then says, I will introduee an antiseptic to prevent decomposition of the fibres. Why did he introduce an antiseptic? If you can preserve these fibres with an antiseptic why not preserve the whole? What is the use of extracting the pulp at all? Now I will suppose that I have a tooth. It has a cavity. When I begin to excavate, I cut off the terminal ends of the fibres, My patient cries out. He says, you are right in on the nerve. A sensible man ought to admit it; for he is cutting the processes of the dental nerve, which have a direct vital connection with the pulp itself. I once asked a question in the Illinois society seven or eight years ago, when the subject of treatment of exposed pulps was being discussed,—"When is the pulp of the tooth exposed?" There were as many answers, almost, as there were men in the convention. One man said the pulp is not exposed till you can see it with the naked eye. Another said, if you get blood from the cavity you may know the pulp is exposed. Another said there is an exposure if there is a continuous pain. The pulp is exposed, another said, if it is painful to the touch of an instrument. There was great difference of opinion on the subject; they could not agree. I believe that the pulp of a tooth is exposed just as soon as the enamel is passed.

One thing further; I presume every member of this convention has received in the last five or eight years circulars recommending some particular anesthetic warranted safe to be used in any cavity without endangering the pulp. I tell you, gentlemen, beware of every such thing. No man can carelessly, hurriedly or ignorantly interfere with the dental fibrils without endangering the pulp of the tooth. The fact that we

have filled so many teeth having but small cavities and the pulp dies is evidence of that statement. Local anesthetics are dangerous, and I am afraid to use them unless I know their composition. There are some important features of life which may be illustrated by the prowing plant. For instance, the form in which the roots of a tree are distributed—the elm, for example, one of the favorite trees which is transplanted from the forest. It has some large roots, simply for the mechanical support of the trees, they hold the tree in the ground. The life of the tree is maintained in the roots—the minute fibers, and whenever I cut off the rootlets I endanger the life of the tree. It is possible I may make it live after cuiting off some of the larger roots, if too many fibers are not also cut. Wishing to give the tree more mechanical support, I say, John, you may go and stake up the tree so that it will not blow down. John gets a spade and puts a stake here, and here and here and cuts off most of the fibres, and says, the tree will grow, I did not touch the roots at all. So the dentists says, I did not touch the pulp at all, I have not damaged the tooth. It is only the *fibres of the dentine*. Dentists should consider that there is risk in every operation on the dentine because what we falsely call *fibers* of the *dentine* are really fibers of of the pulp—pulp processes. When these are cut or inflamed by decay, a pathological condition is established which may extend to the pulp, as a *nerve centre*. This expresses my idea or conception of the pulp of the tooth as a dental ganglion. Now I wish you would follow me a little while and I explain myself more fully.

The teeth as you all know are supplied with nerve tissue from the trifacial nevre which originates by two roots—one a large root and the other a very small one. The large root is from the great sympathetic system, known also, very commonly, as the *ganglionic* system. Hence, the development of numerous ganglia throughout the distribution of the tri-facial nerves—such as Meckel's ganglion, Ophthalmic ganglion, Otic ganglion, Maxillary ganglion, etc., and anatomists tell us, they are very commonly formed near the terminal ends of the nerves.

The ganglia are distributing points where nerve tissue divides into fibers which are distributed to the peripheria of organs. One writer calls a ganglion a little brain. Ganglia are also nerve centres to receive impressions from the peripheria, or surrounding parts, and transmit them to the brain, the great sensorium.

The Maxillary nerves have such distributing points near the apical foramina, or extreme point of the root, of the teeth. Here nerves are distributed to the dental pulp, to the peridental membrane, to the interalveolar bone, and to the gums. These dividing nerves near the apices of the roots of teeth are often called nerve plexuses. But in their

anatomical structure they correspond more nearly to ganglia than to plexuses, for there is little or no decussation of nerves.

After entering the root canal, there is another and immense distribution of nerve fiber—an incalculable number, corresponding to the number of tubuli in the dentine, They have been traced by microscopists into the substance of the odontoblast cells, with every indication of their passing into and through the tubuli to the periphera or extremity of the dentine.

No one can look now on this description representing truly the pulp with its numerous processes, without discerning plainly that it is a nerve centre. And what is a nerve centre but a ganglion. To it converge all the nerve fibers from the periphera of the dentine, and to this central organ are conveyed all peripheral impressions.

In excavating, therefore, in any peripheral portion of dentine, the sensation is communicated through the nerve fibers to the nerve centre. Also, any pathological condition excited in the periphera of the dentine may be communicated through the fibers directly to the pulp. From this source arises the danger of all operations on the teeth—notably illustrated in the death of the pulp from irritation occasionally excited by mere pin-head fillings.

We should cease to call them dentine fibrils—conveying the idea that they belong to the dentine. We should call them *pulp fibrils*, as they truly are—they are processes of the *dental* ganglion. Keeping these facts in mind it is easy to see how wounding the pulp fibrils may communicate an inflammatory condition to the nerve centre—the *dental ganglion.*

It is plain also to see there is danger in grinding off the enamel and exposing large surface of dentine, in the adjustment of bridge work.

I advise, therefore, more care against wounding the pulp or ganglionic processes. Do more temporary filling with gutta percha or oxyphosphate, in sensitive teeth.—*Iowa Transactions.*

Thomas Dunigan, a young blacksmith, visited New York for the purpose of having a tooth extracted. Severe hemorrhage occurred, and as it showed no signs of stopping he went to his father's house and a physician was summoned. The bleeding still continued, so he was taken to a hospital, where every known means were tried, but without success; death taking place on the sixth day after the tooth was extracted. Dunigan's case was said to be a rare one, resulting from a peculiar condition of the blood—hemorrhagic diathesis. To prevent a repetition of the above, it would seem advisable to make a change in the staff of the hospital in which this occurred. Such carelessness would be deemed inexcusable in dental practice.—*Dental Advertiser.*

METHODS IN DENTAL COLEDGE EDUCATION.

PROF. L. C. INGERSOLL, KEOKUK, IOWA.

Another, a very shining mistake, is, as I thinkIfound in the large number of instructors employed in our colleges. The long list of clinical instructors is peculiar to dental colleges, and constitutes a sort of dental college pageantry,—a glamour of shining names and titles to attract the eye. The long list of titled men proclaimed in an annoucement *sounds* well at a distance. They are as meaning as a Chinese gong at the door of an eating-house. But looking at the subject candidly, let me ask, "Are not these long lists of names more for the purpose of attracting attention and for securing the influence of such names in bringing students to the college than for the legitimate purposes of education?" The system is held before the eye of the student as an important feature of the school. In politics such a measure would be called *bombast*; and in education it is not a kind of stuffiing used to swell the college measure to commanding proportions? When occasionally the opportunity is offered of securing some highly valued service from a distinguished operator it cannot certainly be objected to. When objection is made to the large number invited, the reply is, "It is not expected that many of them will be present to operate; not more than one in ten ever appears at the school." This only shows the falseness of the pretence. Yet there are those who honestly believe a large clinical corps of instructors is a very great advantage to the student in acquainting him with the different methods of distinguished operators; and some colleges advertise the presence or one or more every week of the term. Query: Is it an advantage, of an evil, to give to the student in a ten months', or in an eighteen months' course, a great variety of methods of operating? Is it well to even attempt to give to the student, while in his college course, *all* the ways and methods known to the profession? Will he not come out better at the end to give his attention to the ways and methods of *one* good operator than to have his student-life vext with a variety of methods, with a probability that he will acquire no method *thoroughly?*

Suppose a pupil wishes to learn the art of writing. Shall he have *one* instructor or *many*, each writing a different hand? Shall he form his letters after the pattern of *one* master's hand, or shall he have a new master every week, with some modifications of the forms of letters pertaining to curves, angles, loops, slope, and relation of long to short letters? One week he writes a round hand; the next week under a new teacher he writes an angular hand;then under a new teacher he writes a semi-angular hand, and so on with slight variations every week. What sort of a hand will the boy write at the end of the

term? He will have a disjointed, irregular, illegible mixture of styles, void of all symmetry and grace.

There are various methods of teaching the science of numbers. Would you put a boy who knows nothing of arithmetic under the instruction of three or four teachers, each with his different methods of calculation?

If in none of these instances it is desirable to multiply methods by multiplying teachers, why is it desirable to multiply methods in teaching the science and art of dentistry?

After a student has become proficient in one method, it is time enough then, and after he has left his *Alma Mater*, to acquire the methods of other schools and other instructors. This he can do with profit, in some cases, at least, by attending the various State and district societies, which are the colleges of the profession.

There is another method of instruction which I fear very much to touch in criticism, because of its popularity, and lest I should be misunderstood. It seems quite impossible even for the best masters of rhetoric, belles-lettres, philology, and elegant literature to so construct language that it may not be misconstrued and drawn from its intended meaning. The method or custom to which I refer is that of intrusting, to so large an extent, dental education to those who have had no special education in dentistry. While it is true that medicine and dentistry are based on the same fundamental sciences, each requires a different grouping of facts and principles to be presented to the special consideration of the students of the respective professions. One educated for the medical profession and not the dental, the whole current of whose thoughts eddies around the medical practice, cannot make the proper grouping of facts and the proper application of principles for the dental student.

Take, for example, the science of chemistry. This is considered one of the medical sciences. Suppose it is taught as an abstract, independent science, apart from those groupings of facts and lines of thought which tend toward the medical practice on the one hand and toward the dental practice on the other, neither the medical student nor the dental student derives much practical benefit from the lectures. The student wants *medical* chemistry or *denta* chemistry, not abstract chemistry. The dental student also needs *dental* physiology, and *dental* pathology, and *dental* therapeutics; to teach which profitably to the student, the teacher must himself be a practical dentist. A medical graduate who had passed through one of our university schools where the professor of chemistry was second to none in the land, so far as the abstract science was concerned,—for before him all material

things seemed analyzed at his touch,—told me that after taking two full courses in chemistry he did not bring away with him from the college the kind of chemical knowledge that was of value to him in practice. He got too much chemistry and no medicine.

A dental practitioner whom I met on the cars on my return last year from the International Medical Congress, and who seemed like an intelligent man, told me that after graduating from both medical and dental departments of one of our foremost universities in the East, he did not feel competent to open an office and practice. What was the matter? I asked. His reply was: "Too much medicine and too little dentistry." A student studies dentistry not merely for the love of science, caring not what the science is, but he studies it for the sake of a livelihood. As desirable and important as deep and broad foundations are, they may be made *so* deep and broad as to exhaust one's resources and prove an obstacle in the way of rearing the superstructure. A man who wants a house to live in cannot afford to spend a life-time in laying the foundation.

The books of fundamental science used in medical colleges are not adapted to the wants of dental students; hence the two classes cannot be educated together without a useless expenditure of time on the part of the dental student. I use the terms useless expenditure and waste of time guardedly. Do not misunderstand me. I do not use the word *waste* in any absolute sense; it is a waste of time only relatively to the aim and purpose the student has immediately in view. He must take it for granted at the outset that all he will get in the college term, of any branch in the curriculum, will be but a compendium of the science. It becomes therefore of wise discrimination as to how far and how much relating to each branch of study he will attempt to obtain during the term. The medical student is expected to give as much attention to the anatomy of the foot as to the anatomy of the face; because, looked at from the stand-point of practice, they are equally important. But the dental student, receiving his instruction in anatomy in the same class, does not look on the anatomy of the face and of the feet as equally important from the stand-point of the dental practice. He will never be called to the foot professionally; he will always stand at the head. However desirable it may be for him to understand botany, geology, mineralogy, and other correlated sciences, he has no time for these during the college term. He has only time for that which is considered necessary in preparing him to enter at once successfully on the practice of dentistry. What he has omitted must be taken up afterward; to do which he must become a life-student.—*Cosmos*.

PORCELAIN TIPS.

DR. G. W. MELOTTE, ITHCA, N. Y.

In the *Universal Medical Annual*, vol. iii, p. 514, is an article by Prof. J. Bond Littig, of New York, entitled "Porcelain Tips for Broken Front Teeth Having Living Pulps," which is well worth perusal; but which I fear will be seen by comparatively few dentists, because of its not being connected with the general line of dental literature. It presents two methods which are practical, the second of which I have tried in a case of abraded teeth, restoring two centrals and one cuspid. The pulps were alive, but there was no great difficulty in making retaining-grooves. The operation was successful, giving the patient, a lady of about fifty-five, much satisfaction in getting rid of the unsightliness of gold contours and with greater promise of permanence.

My next case was for a young lady of sixteen: cuspid undeveloped and corrugated, as is usual in cases of atrophy; otherwise healthy. To avoid exposing the pulp and to obtain firm anchorage I resorted to the following method: The end of the root was ground off smooth, and a circular groove one-sixteenth inch in depth was made with a trephine of the same diameter. This caused only slight pain, the trephine being rotated by hand, which is safer than the engine. A cross-pin tooth was selected of a thickness a little more than the length of restoration required; the pin surface of the tooth flat, and the distance apart of the pins equal to the diameter of the groove. A platina tube, a trifle less in length than the depth of the groove and of the same diameter as the trephine, was then formed of No. 29 plate on a mandrel, and soldered with pure gold. Two slots were cut with a separating file in the tube to receive the pins, after which the tube was waxed and placed, invested, carefully heated, and attachment made with gold solder. After cooling, the tube was placed in position, and with fine pumice-stone and water a perfect joint made by carefully rotating the tooth, after which it was removed and the overhanging portions ground away till it was found to be nearly the size and shape required. The rubber-dam was then applied, and the groove and surfaces of the tooth made clean and dry. Notches were cut in the end of the tube with the separating file for the ready displacement of the excess of cement as well as to secure firmer anchorage. A creamy paste of zinc phosphate was placed in the groove and around the tooth. The tip was put in place and firmly rotated till the excess of cement was forced out, forming a close joint. After the cement became hard the finishing was done with fine corundum wheels, cork, and pumice. This device has given the patient great satisfaction, and adds not only another method of

tipping teeth having live pulps, but suggests a means of attaching a part or whole of an anterior porcelain crown.

I would not advise a tip where dentine is too sensitive to admit of making a proper retaining-groove or anchorage. Another advantage of the method I have described over crowning is that so much of the sound dentine is saved. I would also suggest the making of teeth with three pins having heads to come in the line of the groove made with the trephine, which would save the trouble of making a tubular anchorage.—*Union Convention at Buffalo, in Cosmos.*

OUR DENTAL COLLEGES.

DR. W. W. ALLPORT, CHICAGO.

Extract of Address before the American Academy of Dental Science.

I am aware that it is said the demand of the age is for better dentists and better dentistry. I do not deny that there is need for a better class of dentists; but, at the same time, I believe that the average skill of the graduates of our colleges is really up to the demand of the general public. Let it not be inferred by these remarks, that I wish to sanction or apologize for the shortcomings of our colleges in graduating those whom they know to be unfitted for practice, and unworthy of the honor conferred upon them. I merely state what I regard to be a fact; they supply, not the *need*, but the actual demand of the public in the productions which they send forth. The principle is not unlike the inexorable laws of supply and demand in trade. The people usually get what they appreciate and demand, whether it be in commerce, education, or professional services. Let those, therefore, who desire to see our schools more exacting as to the qualifications of their graduates, see to it that, not only by a correct example in practice on their own part, but, also, by a systematic and correct course of popular dental instruction in the public prints, journals and otherwise, the people are taught the importance of saving their natural teeth, and the difference between correct practice and quackery. Then, too, it will be well for some of those who find so much fault with our dental colleges, to take care that there should be such an elimination of students, that those only who have a sufficient quantity of brains and other requisite qualifications to make good practitioners be encouraged to enter the practice, and that such private instruction be imparted to them as shall qualify them to receive the greatest benefit from a high grade of teaching in our colleges, or else cease their fault finding.

I do not wish to exonerate our schools from the just blame that should be attached to them; but let it be remembered that that sin of omission on the part of the profession is quite as great as the sin of commission on the part of our colleges. "Let him that is without sin cast the first stone."

THE CAREFUL FINISHING OF AMALGAM FILLINGS.

DR. GEO. F. CHENEY, D D.S., ST. JOHNSBURY, VT.

In the January number of the *Archives of Dentistry*, Dr. Harrison of Cadiz, Ohio, reports a case of a molar tooth extracted by him, that had been filled on its posterior surface with amalgam, where the amalgam had been forced up over the cervical wall, between it and the wisdom tooth.

This filling became such an irritant to the surrounding tissues that absorption advanced rapidly, and when operated on by him the wisdom tooth was destroyed, all the process gone, and a portion of the palate bone considerably absorbed, as well as much injury done to the adjacent first molar.

This of course, was mere carelessness, and calls to mind a similar case in my own practice, tho not so extensive.

A lady came in asking for an examination of a tooth that was troubling her. Examination revealed pus oozing from between an upper first and second molar, and by probing, it was found that a mass of amalgam had been crowded between the teeth which was very difficult to remove, and on removal, proved to be nearly as large as the half of a silver three-cent piece. I cannot account for room for so much to be crowded up there unless a pocket had been previously formed by food, the teeth being quite close.

It is time that some of these cases should be brought up to warn us against such unpardonable carelessness. In nearly every mouth we examine, with many amalgam fillings, we see evidences of carelessness in finishing; the gum instead of being healthy is of a bluish color and bleeds on the slightest touch, and on examination we often find the filling over-lapping the cervical edge a thirty-second of an inch and sometimes more. The over-lapping filling is an irritant to keep the gum constantly inflamed; it also leaves a shoulder on which filth accumulates.

Too much care cannot be given the finishing of amalgam fillings. I have for the past year or so adjusted the rubber-dam for most proximal fillings of amaglam, and I find enough better results can be obtained to justify the extra labor.

In most cases the dam can be adjusted without liguteres, by cutting small holes, and soaping the rubber on the under side, and putting over four or five teeth; this makes the adjustment of the dam comparatively easy.

I work the amalgam into the cavity with bibulous paper, following Dr. Bonwill's instructions, then finish with burnishers as much as possible, and with a piece of floss silk go up between the teeth, forcing the

surplus amaglam up against the dam. Clear this surplus out as much as possible, and taking off the dam will remove the remainder.

I then dismiss the patient, asking him to come in for another sitting.

I finish such fillings with sand paper disks and strips.

When I cannot make this second engagement, I find by the use of the floss-silk between the teeth, these fillings can be very nicely finished without leaving an over lapping mass at the cervical edge or between the teeth.

I have also found a nicely adjusted matrix of very great service and almost indispensable in some cases.

I am convinced that many of the so-called cases of ptyalism are caused by carelessness of the operator and not by the amalgam.—*Ohio Journal.*

BLEACHING TEETH CHEMICALLY.

DR. E. C. KIRK, PHILADELPHIA.

Bleaching in general may be defined as a chemical reaction between a compound having color and some substance capable of affecting its composition in such a manner that the color is discharged, or, in other words, of so affecting the integrity of the molecule of the coloring matter as to destroy its identity, which necessarily results in a loss of its distinguishing physical characteristic, viz., its color.

All chemical changes in matter are the result of or flow from an alteration in the kind, the number, or relative position of the atoms which compose the molecule; from which it follows that anything which affects the composition of the molecule necessarily alters the character or identity of the matter operated upon, so that it no longer exhibits the properties which belonged to it before such alterations were made.

A single familiar example will serve to illustrate this. Sugar, which has the composition $C_6H_{12}O_6$, may be dissolved in water, indefinitely almost, and within certain limits it can still exhibit the properties of sugar, is recognizable by its sweetness, and may be recovered in the solid crystalline form by evaporation of the solvent. The mere act of solution has not affected the composition of its molecule; but if we drop a lump of sugar on the stove, or pour over it concentrated sulphuric acid, a disassociation of the atoms in its molecule takes place by the abstraction of its water-forming elements H and O, and we have the carbon remaining as a black, coke-like mass. This we understand to be a chemical change.

Now, all organic substances have as their distinguishing component, carbon, united generally with one or both of the elements H and O, and, in those resulting from tissue metamorphosis, nitrogen. It is

not necessary for our present purpose that we should know the exact composition of the detritus of pulp-tissue and broken-down food substance which gives rise to tooth-discoloration. It is sufficient if we recognize that it does contain the principal elements which I have named as common to organic compounds. Accepting this to be the case, we can then understand the effect of bleaching agents upon it.

Two general classes of substances have been introduced to the profession for the purpose of bleaching teeth. The first, those which act as oxidizing agents, and which destroy the integrity of the coloring molecule by removing its hydrogen; the other, those which acts reducing agents, and destroy the integrity of the coloring molecule by removing its oxygen.

To the first class belong hydrogen peroxide, H_2O_2; potassium permanganate, $K_2Mn_2O_8$; chlorine and the chlorine group. To the latter, sulphurous acid, SO_2.

In the first class, the action of the first two substances named—viz., hydrogen peroxide and potassium permanganate—is readily understood when the character of the compounds is taken into account. Both are rich in oxygen; both are unstable and ready to give up their oxygen in the nascent state at any favorable opportunity; and when brought into contact with organic matter rich in hydrogen, the latter is seized upon by the liberated oxygen to form water, and both compounds as such are destroyed.

The main practical difference in the action of the two substances is in the character of the resulting by-products. Thus, in the case of hydrogen peroxide, H_2O_2, the loss of its one atom of O leaves simply a molecule of water; but in the case of the potassium permanganate there results among other things manganese dioxide, MnO_2, a dark brown solid which in itself produces a discoloration that must be gotten rid of afterwards by solution in oxalic acid, with which it forms an almost colorless and soluble compound. I have used this substance for bleaching teeth; but care must be exerted not to use it in a too concentrated solution, otherwise the final treatment with oxalic acid may fail to completely remove the discoloration from the manganese dioxide which has been precipitated in the tubuli, and leave the tooth in a worse condition than at first. Used with care, in dilute solutions of a claret color, and almost immediately followed by a strong oxalic acid or binoxalate of potassium solution, I have obtained good results when the tooth structure to be bleached was not very thick or dense.

That its bleaching powers are quite active, I think I can demonstrate very satisfactorily with these dark sponges. I have here some unbleached sponges of the natural brown color which they possess

when taken from the water. I have prepared here a glass jar containing a solution of potassium permanganate. On immersing the sponge in this solution for a few moments, you readily observe a change in the color, which has passed from a light brown to a dark brown, almost bordering on black. A chemical action has taken place between the permanganate and the coloring matter of the sponge, which has resulted in the destruction of the latter, and the deposition of the brown oxide of manganese throughout its texture. If I now apply a solvent which will remove the deposited oxide of manganese, the result of the bleaching or oxidizing action of the permanganate of potassium will be evident. We have a suitable solvent in the solution of oxalic acid, which I have prepared in this other glass jar, and upon immersing the sponge for a few moments you see its color is discharged, and it comes out beautifully bleached. I hold up for your inspection the bleached sponge alongside of one which was not treated, and, as they were originally both of the same color, the difference is at once evident.

The use of hydrogen peroxide is sufficiently simple, and does not require any especial elaboration here. I have not succeeded with it as well as some other operators appear to, as the teeth treated with it seem to resist the action of the peroxide after a certain point has been reached, leaving them of a brown or yellowish tint.

By far the most interesting and important agent we have for the bleaching of teeth is chlorine, for the introduction of which, and its first successful application to the bleaching of teeth, we are indebted to Prof. James Truman, of the University of Pennsylvania, some twenty-five years ago.

In my classification of this substance, I placed it among the oxidizing bleachers. The reason for this is that while in a few instances, and under special circumstances, chlorine may act directly upon the coloring matter by uniting with its hydrogen; yet it has been found in practice to act with much greater rapidity and energy in the presence of moisture; in fact, some organic colors are absolutely unaffected by chlorine in the absence of moisture. These facts have led investigators to the conclusion, and I believe it has been demonstrated, that chlorine acts by first seizing upon the hydrogen of a molecule of water with which it combines to form hydrochloric acid, and the oxygen which is liberated in the atomic or nascent state attacks the coloring matter and destroys it, the chlorine being thus, indirectly only, an oxidizing agent,—the relation of chlorine to the oxygen in the bleaching operation being, in some respects, similar to that of the monkey and the cat in the fabled chestnut-eating episode.

Prof. Truman's method, which is now so generally known as to need no extended description, depends upon liberating chlorine from

calcium pydrochlorite, commonly called bleaching powder or chloride of lime, in the cavity of decay and pulp canal by some weak dilute acid. He prefers and recommends a fifty per cent. solution of acetic acid, though oxalic, citric, or tartaric acid may be used; in fact, any dilute acid will serve to liberate the chlorine. The treatment of the tooth previous to bleaching is the same for all methods. The upper third of the pulp-canal should be solidly filled with gutta-percha. Gold has been recommended; but should not be used in any tooth to be bleached with chlorine, as it is attacked by the latter, and the auric chloride formed decomposes in the presence of organic matter by the action of light and oxygen, and results in a permanent purple stain, which cannot be gotten rid of. For this reason, a tooth to be bleached should have gold fillings removed, if they are in position.

The cavity should in all cases be washed out with ammonia or borax to remove fatty matter, and no substances which has the power to coagulate albumen should have been used, as such prevents the ingress of chlorine to the tubuli. For the final washing, distilled water should be used, as river water ordinarily contains sufficient iron to stain the tooth in combination with the chlorine as ferric-chloride.

Lastly, after the bleaching is completed, the cavity and pulp-canal should be filled with oxychloride of zinc, which should be inserted with instruments of bone, hard rubber, or wood. It should be carefully borne in mind that no metallic instrument should come in contact with the tooth, after the chlorine has been applied.

Since the publication of Dr. Truman's method several modifications of it have been brought forward; thus, the solution of chlorinated soda, known as Labarraque's solution, has been used as a medium from which to liberate the chlorine. The principle is, however, in all respects identical with that of Dr. Truman's method.

An interesting method, somewhat different from that of Dr. Truman's, was introduced by Dr. A. W. Harlan, of Chicago, in 1884. He uses aluminium chloride in the cavity, from which he liberates the chlorine by means of hydrogen peroxide, thus:

$$Al_2Cl_6 + 3H_2O_2 =$$
$$Al_2O_3 + 3H_2O + Cl_6$$

The bleaching is performed by the chlorine, which is liberated by the action of H_2O_2.—*1st Dis. Den. So. N. Y.*

Going With the Times.—"Professor, what are your views concerning the schools of medicine and theology?" Professor: "That depends upon circumstances. When I am slightly ill, I am homeopathist and a Unitarian; but when I am very sick, I am an allopathist and a Calvinist."

THE KELLER COMPANY.

Pleas before the Hon. Edward O'Rourke, Judge of the Thirty-eighth Judicial Circuit of the State of Indiana, at a regular term of the Allen Circuit Court, held at the Court House, in the City of Fort Wayne, County of Allen, and State of Indiana, commencing on Monday, the 6th day of February, A. D. 1888, to wit:—

THE B. F. GOODRICH CO.
vs.
JOSIAH O. KELLER,
Trading as the Keller Medicine Co.

BE IT REMEMBERED, That on the 30th day of March, A. D. 1888, the same being the 44th Judicial day of the February Term, 1888, of said Court, held at said Court House, before the Honorable Judge aforesaid, the following decree of fnjunction was granted in the above entitled cause by said Court, to wit:—

Whereupon, it is further ordered, adjudged and decreed that said defendant, JOSIAH O. KELLER, trading as the Keller Medicine Co., be and he is hereby perpetually enjoined and restrained from printing or in any form using, in his business under the name of the Keller Medicine Co., or otherwise, or in any manner or form, the trade mark, "Akron Dental Rubber," upon boxes or other devices inclosing or adapted for enclosing dental rubbers, and also from in any manner using said trade mark; and said defendant is further perpetually restrained and enjoined from in any manner using the word "Akron" upon any boxes, labels or other devices for packing or enclosing dental rubbers, and from using said word "Akron" for marking, designating, labeling or advertising dental rubbers manufactured, sold or offered for sale by the defendant or his agents.

It is further ordered and adjudged that the plaintiff do have and recover of and from said defendant the sum of one hundred dollars, and its cost in this behalf expended.

State of Indiana, County of Allen:

I, GEO. W. LOAG, Clerk of the Allen Circuit Court, within and for said County and State, certify that the above and foregoing is a full, true and perfect copy of the Decree of Injunction, as granted, pronounced, entered and signed in the above entitled cause by said Court, as the same appears and remains of record in Order Book 21, page 49, of said court, in my office.

In Testimony Whereof, Witness my name and the seal of said court, hereto subscribed and affixed, at the City of Fort Wayne, this the 2d day of April, A. D. 1888. GEO. W. LOAG,

[SEAL] *Clerk Allen Circuit Court.*

The above decision was sustained by the Supreme Court of the State of Indiana, February 21st, 1889, and a rehearing denied.

THE EDITORIAL FUNCTION.

[Editorial in *Cosmos.*]

The exercise of the editorial function is so liable to occasion unjust reflections and unwarranted conclusions that brief space may be permitted for the presentation of a few general statements.

First. It should be remembered that the editor has probably the advantage of a wider outlook than the writer. As to the acceptance or rejection of a paper submitted for publication, the editor is of necessity obliged to consider the interests of his journal and of its readers more than those of any single contributor. The duty which he owes to his subscribers outweighs the claims of business or friendship. If the periodical has a well-defined field, he cannot admit the discussion of irrelevant topics. Subscribers have paid for it as the vehicle of information in their specialty, and they have a right to complain of the use of its pages for matter not pertinent thereto. Even within this limitation, if the subjects be of local rather than of general interest, or if it be threadbare by frequent discussion, or be dealt with in an elementary manner, proper consideration for the welfare of his journal compels an editor to respectfully decline its publication, and such considerations appeal to him as they cannot to one not occupying his vantage ground, tho a rejection is frequently as painful to the editor as it is disappointing to the writer.

Second. It would seem almost superfluous to assert that the editor is as desirous to obtain a good article as a writer can be to furnish it, and that, therefore, no well-written paper is rejected except for a valid reason, and after a careful survey of the situation.

Third. An editor who wishes to maintain a literary character for his journal must measure every contribution by the standard which he has erected. Judged by such standard, many articles must either be rejected or made approximately to conform thereto. A reader of even superficial culture soon catches the tone of the periodical which he reads habitually, and if it pleases him he will not be satisfied with a lowering of its style; and tho he may not possess the gift of writing well himself, he recognizes and appreciates it in others. While it may be impossible to maintain the same high tone in every instance, the rule is to keep the exceptions as near the pitch as possible.

Fourth. It should not be forgotten that good contributors are a necessity to the successful editor, and it is of vital interest to his journal to encourage and develop them. In this effort there is much laborious editorial work, credit for which the editor cheerfully waives in favor of his contributor; with a more mature judgment, contributors subsequently recognize the value of an editorial revison which at the time they were disposed to resent as meddlesome. The reasons

for this are not difficult of apprehension. The editor is constantly exercising the critical faculty; being practiced in the art of selection, he readily sees the merits and demerits of the paper before him, and makes honest effort to improve the author's presentation of his theme.

Fifth. No intelligent editor will claim the right to change the *meaning* of his correspondent; while, on the other hand, he will be solicitous to correct verbosity of style, inelegance of expression, faultiness of grammatical construction, and to make plain, by modification, obscure or involved sentences—in a word, to make the writer say concisely that which he had desired to say, but had failed to make clear by inexperience or undue haste.

Sixth. The privilege accorded to the writer to revise proof of his contribution gives him the opportunity to correct any misapprehension of his meaning on the part of the editor, and should be accepted as evidence that there was no intention to be otherwise than helpful to him.

Seventh. Contributors to the literature of a profession should bear in mind that, so far from there being any antagonism between writer and editor, there is assumed to be a common purpose to present that which shall be creditable alike to author, editor, journal and profession.

Eighth. Inexperienced writers should therefore accept editorial revision as well meant, even if not well done, and intended as a corrective for faults, or what appear as such to the editor, and as an inspiration to more careful effort.

Ninth. While the foregoing summary of points submitted for the consideration of our contributors may at first reading appear egotistic it is not meant to assume superiority, but simply to invite thought and promote a charitable feeling for those occupying editorial chairs, whose best efforts too often bring them reproach and censure where they had hoped for appreciation and thanks.

There is a Limit to the Use of Obtunders.—In a tooth that is so highly organized as to cause severe pain, I regard it an operation of great danger to insert a large gold filling. Often, if an obtunder be used to render the operation possible, the tooth will return to its original sensitive condition that renders it exceedingly dangerous to fill during that period. If we had a perfect obtunder, we could do better. In case a tooth was not sufficiently calcified, I would rather insert a gutta-percha filling, and rely on nature to restore a normal degree of sensitiveness. If we know a tooth is sufficiently dense to withstand thermal changes, such treatment may be resorted to with comparative safety. The use of imperfect obtunders has caused the loss of many teeth.—*Dr. Palmer.*

FERMENTATION AND PUTREFACTION.

DR. WILLIAM H. ATKINSON, NEW YORK.

From my earliest boyhood molecular activities have been the charm and puzzle of my life, being coupled with an almost insane reverence for the spoken or written sayings of teachers who had undertaken to grapple with, unravel and formulate mental and bodily activities.

There has always been a singular inconsistency in the desire to have my own mental make-up satisfied by the formulæ of word and text of the teachers, abject fealty to which, I had been taught, was the only open door to scientific certitude in conscious ratiocination, and a sort of a loyalty to this domination, that I but half acknowledged as legitimate over my own psychic and affectional mode of consciousness, had made me timid on the one hand, and aggressive on the other, in every effort to get at finalities.

This mixt state of a desire to be first, right myself that I may, second, be useful to help others to be right, has caused me to hesitate as to the form of expressing what views I have on these questions.

First—"What is fermentation?"

Second—"What is putrefaction?"

Third—"When does fermentation become putrefactive?"

At the very outset it is necessary to comprehend this group of three questions that are but the outcome of the first, namely, fermentation.

That I may not be tediously analytical, I will endeavor to confine myself to the mental processes through which I am carried to arrive at what to me is an understanding of the simple and complicated process of contact, interpenetration and churning of prime elements within the sphere of influence of the power through which these molecular changes are affected.

What is fermentation? Answer: Boiling. This may be of many varying degrees, from the slightest disturbance of the molecular mass (by which currents of incoming energy, known as heat, transport portions of the mass from one site to another, without molecular disruption, thereby increasing the bulk at the new site), to the setting free of fine particles in the form of vapor, retained within certain limits forming a chamber, the upper part of which is occupied by the vapor set free, still without disruption of the molecule. This would hardly be complete without having something more than water in the chamber, namely, a fermentable sugar.

To study the process of fermentation we must have a fermentable body dissolved in water, to which to add a substance, in the presence of which the change known as fermentation takes place.

This is a microscopical plant, the common example of which is the yeast plant (*Torula cerevisium*).

So long as there is sugar enough to support the multiplication and growth of the torula, the plant will live on the sugar by converting the carbon and hydrogen of the sugar into its own body on the one hand, and either alcohol or carbonic dioxide or both, on the other, according to the degree of heat, pressure and length of time in contact. As soon as the fermentable sugar has been consumed the process of fermentation ceases, and the alcohol and carbonic dioxide will not again appear till more of the fermentable body be added to the mass.

The products of this molecular activity are not offensive to the smell. Putrefaction, or the production of aromatic bad smelling vapors, appears when nitrogen is in the fermentable body.

It is only in this sense that fermentation can be said to change into putrefaction by reason of the retrogressive metamorphosis breaking up the old and forming the new bodies known as ptomanes—alkaloids—elaborated in the presence of the much-talked-of bacteria. Thus the fermentative process presents as under the various circumstances with vinous, acetic and cadaveric products, some of which are very destructible to vegetable and animal bodies.—*Odontographic Journal.*

TOBACCO FOR INSOMNIA.

EDITOR OF THE ITEMS OF INTEREST:—

Dear Sir.—In the April number I notice an article on *Insomnia*, from the pen of Dr. W. F. Hutchinson.

Having had some experience in the treatment of such unfortunates, allow me to suggest that, if the patient must use poisons, let us select the kinds best adapted to the temperament and habits of the patient. If he has not been accustomed to the use of tobacco, and is inclined to be adipose, he will derive the most benefit, with the least harm, by smoking very mild tobacco, through a clean clay pipe, immediately before retiring at night. A very small quantity will suffice to insure a refreshing sleep.

Yours truly,

Rossville, N. Y. E. A. HEWEY, M.D., D.D.S.

And so this is the treatment Dr. Harvey would give my wife!

"Oh, but we suppose it is for you, Doctor, we were prescribing."

For me! Why the very thought of the disgusting stuff keeps me awake! And, besides, why do you make a distinction between me and my wife? If it is fit for me, why is it not for my wife?

And wouldn't she look nice with a clay pipe in her mouth, smoking? Yet she would look just as well as I would. Oh, go away with your filthy stuff. I can lay awake, but I can't make my nose a chimney for the Devil's incense.—ED. ITEMS.

ELECTRO-METALLIC PLATES.

DR. L. P. HASKELL.

The *Archives* for April criticises my article in the March ITEMS, and it will be seen that the real point in my exceptions to the work in question is entirely ignored, viz.:

"Plates are liable, from undue strain, to break, and especially partials, and these plates will be found, from their *granular* structure, to break more readily than metal that has been melted and rolled, and when broken become worthless from the fact that they cannot be soldered without being made *soft* permanently."

To this can be added that the clasps attached as they are, and also the teeth, will be *very* liable to break off, and the only way they can be repaired will be by the same process of electro deposit; to do which, they must be sent to New York, no matter where the patient may be, and then the same liability to break still remain.

The criticism in regard to the *two layers of silver* was unnecessary, as the writer must have seen that it was either a typographical error, or a slip of the pen, as a deposit of that character would have made a silver plate, with no gold in sight.

I use exclusively 20 carat plate and 20 carat solder; my comparison of this metal with 18 carat plate as to rigidity was because it is more rigid than 20 carat.

The small amount of gold in these plates makes it very difficult to polish the rubber attachments without exposing the silver, and the wear in the mouth and brushing will sooner or later have a silver surface.

Durand, in the May ITEMS, again begs the whole question; does not meet my objection as to the repair of the *broken* plate, except as he contradicts himself.

He says "the dentist heats the plate to a red heat against our advice, and at his own risk," and then says that they have *soldered* broken plates. Now will he explain *how* that is done; if the plate cannot be heated red-hot, unless it is done *with a soldering iron and tinman's solder*, upon which he deposits more gold. A beautiful specimen of repair of a denture! If that is the best they can do in reply to my *vital* point of criticism, the sooner they withdraw this method of artificial dentures from the market, the better.

I should be glad to know that some such method could be made successful to take the place of swageed plates, but most assuredly it has not been found yet.

CARBOLIC ACID AND CREOSOTE.

It is not surprising that the following item should go the rounds of the journals that do not stop to think about what they publish:

"Creosote, as a dental application to painful cavities, is complicated with the inconvenience that the liquid is apt to give trouble by coming in contact with various parts of the mouth. This may be avoided by mixing it with collodion, in the proportion of ten parts of the collodion to fifteen parts of creosote. The mixture forms a sort of jelly, which, besides being more manageable than plain creosote, forms a var nish which seals the cavity and protects the dental nerve substance from contact with the air."

A recent issue of one of the dental journals published the above, and the editor adds the information that "pure carbolic acid may be used in place of the creosote." We would add that it not only may be used, but must be, if the collodion is to be coagulated.

We would advise a closer study of the United States Pharmacopeia by those who have published the above item.—*Meyer Brothers, Druggists.*

"**Copper.**"—For years I have silently watched the tenor and drift of the *copper idea.* I thought, perhaps, I might live long enough to see the beginning of the end. It is coming. In the *Dental Office and Laboratory* for May, 1889, is an article from the pen of A. Morsman, through the *Archives*, wherein he says: "Copper has the reputation of being of great consideration as a component of dental alloys." And he says, further, that he is of the opinion that it "will prove to be another fallacy." I am of the same opinion. It has proved a *fallacy* so far as my hands are concerned.

Years ago, I made repeated experiments with the metal in the manufacture of amalgam. But I did not reap the satisfaction I desired, and discarded its use. In looking over my list of amalgam formulas, I notice the marks "good," "fair," and "poor" attached to each—the last where the copper is a constituent. But enough at present. Let me read, watch, and wait.—*G. W. Adams, D. D. S., Bristol, Pa.*

Chicago Dental Society.—At the annual meeting of the Chicago Dental Society, held on Tuesday evening, April 2, 1889, the following were elected officers for the ensuing year: P. J. Kester, President; D. M. Cattell, First Vice-President; W. J. Martin, Second Vice-President; A. E. Baldwin, Secretary; E. D. Swain, Treasurer; Louis Ottofy, Corresponding Secretary; A. W. Harlan, Librarian; Member of the Executive Committee, J. Austin Dunn; Board of Censors, F. H. Gardiner, C. F. Hartt, and L. L. Davis; Delegates to the International Dental Congress at Paris, France, September 1–8, 1889, were appointed as follows: A. W. Harlan

(Secretary), J. N. Crouse, T. W. Brophy, J. A. Swasey, P. J. Kester, W. W. Allport, A. E. Baldwin, Louis Ottofy, L. L. Davis, J. W. Wassall, and W. B. Ames.

A report from Dr. Crouse showed the Dental Protective Association of the United States to be flourishing, and dentists throughout the United States are requested to become members of this association. Write to J. N. Crouse, Chicago.—LOUIS OTTOFY, *Corresponding Secretary.*

The Commencement Exercises of the American College of Dental Surgery were held at the Madison Street Theatre, Chicago, March 25th, 1889. The cozy little theatre was made unusually attractive by an admirable display of choice flowers fashioned into appropriate designs and placed in tastefully arranged groups about the stage. The class was well represented by relatives and friends assembled to witness the closing scenes of their college life, and the presentation of their well-earned diplomas, and, through mingled tears and hearty encores, to make the day memorable through years to come.

The exercises were opened with prayer by Rev. W. A. Lloyd; the degrees were conferred by L. D. McIntosh, M.D., D.D.S., who gave as well an address of sound advice to the class. The doctorate address was delivered by C. T. Hood, A.M., M.D. Among other startlling things, he mentioned that the students might expect to have an abundance of practice from the beginning of their careers as dentists; it, however, would lie in the way of economy and waiting. J. A. Whipple delivered the class address. A pleasing feature of the exercises was a recitation by Miss Josephine E. Preston, which was a deviation from the electrotyped form of college commencements, and which met with exceptional approval from an appreciative audience.—*Wm. Henry Dodge, D.D.S.*

The following is a list of the graduating class: F. J. Burr, 78 State street, Chicago; S. T. Burke, Maywood, Ill.; H. R. Boulter, William H. Dodge, F. Fred. Fitch, J. A. Gwyune, F. J. Gallagher, A. S. Gleins, W. B. Jones, J. C. Jones, Louisa Möller, Rebecca McIntosh, G. W. McNulty, W. H. Prittie, W. L. Stevens, C. S. Terry, J. A. Whipple, C. W. Waterson, L. P. Wagner, H. C. Young.

The Meharry Department of Medicine and Dentistry for colored students of the Central Tennessee College have just graduated fourteen medical and six dental students. For a new school, under a new departure, this is doing well. Prof. G. W. Hubbard, Dean, of Nashville, Tenn., is doing a noble work.

BOSTQN DENTAL COLLEGE.

In the year 1867 several of the dentists of Boston, desirous of a greater diffusion of the knowledge of their amount in their profession, projected a course of lectures, and established the Boston Dental Institute. This inception proved so promising that immediately there grew out of it a hope for a more permanent and productive foundation. As a result the Boston Dental College received its charter from the Legislature and began its work in 1868. Active and earnest in this work was I. J. Wetherbee, D.D.S., the first President of the College, who has, with the exception of a few years, when the presidency was held by D. S. Dickerman, D.D.S., continued President to the present time. R. L. Robbins, D.D.S., was its Treasurer until his recent death. Many of the prominent dentists of Boston were on the list of its fifteen trustees. This college was the first dental school in New England, and from its first year has had a prosperous life. It is one of the few dental schools that stands unconnected with a medical school or university. In 1880 it left the old form and became a graded school. The present dean was its first dean and has held that office for the last ten years. Its matriculant for the year is 70.

Dangers of Extracting Teeth.—April number, page 170, contains "Dangers of Extracting," on which I would like to ask a few questions. What did the Doctor use during the "three-quarters of an hour" to stop hemorrhage? He finishes by saying: "Now, had that gentleman fallen into the hands of any one who was in the habit of giving nitrous oxide gas, and those teeth had been all extracted at one time, no doubt they would have had a death in the chair." Why does he think so? And how would he have stopt hemorrhage?—*Lawrence P. Leonard, Waseca, Minn.*

TOOTHACHE—SOLIDIFIED CREASOTE.—Creasote, as a dental application to painful cavities, is complicated with the inconvenience that the liquid is apt to give trouble by coming in contact with various parts of the mouth. This may be avoided by mixing it with collodion, in the proportion of ten parts of collodion to fifteen parts of creasote. The mixture forms a sort of jelly, which, besides being more manageable than plain creasote, forms a varnish which seals the cavity and protects the dental nerve substance from contact with the air.

Parr's Removable Bridge-Work.—DR. PARR exhibited some removable bridges at the New Jersey State Dental Society, and a correspondent in the *Dental Review* decribes them as follows: The crowns or caps for the bridge anchorages are made as usual. To these are attached gold bands, so as to form longitudinal slots or grooves on each

cap, into which a spring may he inserted. This spring is heavy, and being attached to the teeth forming the bridge—a spring at each end of the ridge—when placed in position, the springs going down into the slots in the *permanently attached* crowns, the work is as firm and rigid as could be wished apparently, and the patient can remove and cleanse whenever desired. It is claimed that it will hold plates of all kinds—that no plates containing air chambers, or with clasps, need be used; that particularly in the case of lower teeth—diverging and converging—where often teeth were extracted to insert artificial ones, this method can be used nicely, when other bridges fail. That it is a valuable method no one can doubt. It is practical, easily removed, and cleanly as can be expected. It is so nicely adjusted that the patient can readily remove it and replace it without trouble.—*Ohio Jonrnal.*

Manipulating Cements.—Dr. Wassall says: I think there are two secrets in the use of cements that will give us better success with them. First to take just enough of the plastic material on the instrument to fill the cavity and burnish it till it is exactly full, so that it will not need to be cut or ground down after it has hardened. This leaves a surface which has an outside gloss to it, of a condensed vitreous nature. The other is to give the cement more time in setting before the rubber-dam is removed. It was Dr. Harlan who told that he allowed the rubber to stay on, as an invariable rule, one hour, after making a cement filling, and I have followed that plan in most cases since. I find it is possible, in most cement fillings that I make, to put the rubber on another tooth which may be filled with gold probably after making the cement filling. Or the rubber-dam holder may be removed, letting the rubber hang and another rubber may be adjusted in another place. Otherwise the patient should wait the full time while you go on with another appointment. I notice that cement fillings I have made since I adopted these two points have been very much better than they ever were before.—*Ill. Trans.*

The following from an unknown source is quite applicable to dentists and dental journals: However skilled a workman may be, his fellow craftsmen possess secrets of which he is ignorant, and which can, as a rule, only receive their proper dissemination by being published in the specialty or technical papers that are doing so much for the elevation of the American artisans and their numerous callings. Every mechanic who prides himself in his particular line, ought to subscribe regularly to a trade journal—one representing most closely the branch of work in which he is engaged. This should be read closely and carefully, and the hints and suggestions thrown out must be noted with the view of giving them practical tests. By pursuing

this commendable course, a greater degree of technical skill is often acquired at a trifling expense of time and a small outlay of money. Then, too, a knowledge is obtained as to the better class of new text books, appearing from time to time bearing on the exact sciences and applied mechanics. To be well posted is as much stock in trade with a mechanic as to a merchant or professional man.—*Dental Advertiser.*

Be Systematic.—The saying is not more ancient than true, that whatever is worth doing at all is worth doing well. It applies to every man in every pursuit, and in proportion as it is heeded is success attained, while its neglect results in failure. The man of business attainments and fortune does not become so by chance or because he is what the world terms lucky, but simply for the reason that he observes the fundamental principle underlying all success—he adopts a system and steadily pursues it. Chance belongs to fairy-land alone and has no place in material transactions. Everything is subject and reduced to cause and effect, and every action or result if analyzed will prove this true. Hence, the absurdity of those who are constantly expecting to reap their golden harvests without first pursuing the initiatory steps incident thereto. Spasmodic efforts seldom succeed, and spasmodic workers invariably fail. All goes to substantiate this. The astronomer demonstrates to a mathematical certainty the fixed and irrevocable laws which govern the movement of bodies through space, and clearly points out the disastrous results which would follow a suspension of these laws. What is true in this case is equally so in others, and the same principle governs in all things. There must be a cause to produce an effect.—*Dental Advertiser.*

Dr. Holmes: I took some pains to test the sensibility of teeth, by raising the temperature to some hundred degrees, by using a hot air blast. I then used a rubber dam, and went into the cavity with carbolic acid. In most cases the patient could endure the gradual increase of heat, and when that was the case I invariably relieved the sensitiveness. I have had better success with hot air in connection with some agent like carbolc acid, than with anything else I have ever tried.—*Dr. Holmes.*

The Secret of Easy Labor.—That man is in a sad condition who is ever making prodigious effort to do more then he can do. It is just as easy for a star to swing in its orbit as for a mote to float in a sunbeam. Nature never sweats. The great law of gravitation holds the universe on its back as easily as the miller swings over his shoulder a bag of wheat. The winds never run themselves out of breath. The rivers do not weary in their course. The Mississippi is no more tired than the meadow brook.—*Christian Nation.*

For Our Patients.

AN HOUR OF TRIAL.

His arm was round my shoulder laid,
He pressed my head against his breast;
I sighed, but not a word was said,
I felt his heart beat through his vest.

The winds of May blew sweet without,
I thought of bairns at home so fair;
And good man, too, wond'ring, no doubt,
(The hour grew late) I was not there.

His fingers warm upon my cheek,
Still toward his eyes compelled my face.
I only felt; I could not speak,
Fast fettered in that close embrace.

Pain racked, sore tried, I fain would flee,—
His voice my futile struggle stilled;
"Madam, a little patience. See!"
I rise, I smile. My front tooth's filled.

—*Chicago Inter-Ocean.*

THE DENTIST HIMSELF.

The appearance of the operator and his treatment of the patient are very important, and largely promote or hinder his success.

Remember, that "Order is Heaven's first law, and Cleanliness is next to Godliness."

Be master of yourself. Control the temper under all circumstances. Be kind and sympathetic, but firm and self-respecting, dignified, but not distant, and tolerant of human weakness—both mental and physical.

The operating room should be neat, orderly, well lighted and airy.

The north gives the steadiest and clearest light, the southerly aspect is the most healthful, while the western sky affords the longest day.

While operating by direct sunlight, a white Holland shade will so soften the light as to make it agreeable, and yet it remains effective. If the shade be placed outside the window, it affords circulation of air between it and the window, and thus keeps the heat from the room. A white awning serves the same purpose, but shuts out more light.

The operating case should be conveniently placed and of sufficient size to allow of a convenent arrangement of the instruments, each instrument or class of instruments in its place.

Every instrument should be kept clean, free from rust and well polished.

Observe scrupulous cleanliness about the spittoon; wash frequently, deodorize and disinfect. A weak solution sulphate of copper is an inexpensive and effective disinfectant. Other excellent disinfectants are Platt's clorides or permanganate of potash.

Give careful attention to personal cleanliness, especially the hands. Wash them frequently, using the best toilet soap. Keep the nails pared short and scraped clean. When a grimy, rough or chapped condition of the hands obtains, give them a thorough washing in soft water, with the free use of carbonate of soda; partially dry the hands and apply glycerine and rose-water, rubbing well; then rinse in clear, cold water, and wipe dry. This leaves the hands perfectly clean and soft, and promotes healing.—*Fillebrown's Operative Dentistry.*

THE COST OF DENTAL WORK.

J. C. TOWNSEND, D.D.S., PHILA.

The complaint that dental work costs too much is not generally well founded. Professional men cannot keep busy every day, and it costs several thousand dollars before they have business at all. When their labor does come into requisition, it should be more remunerative than work costing but little preparation, and remunerative every day in the year.

Besides, many kinds of business may be made profitable in proportion to the capital invested and subordinates employed. But in professional life nearly all remuneration is the result of the skilled labor of one man. The work cannot be entrusted to subordinates, nor the profit increased by capital.

Then, again, all works of skill and taste require precise knowledge, long experience, and the most careful manipulation. This should bear a fee in proportion, not only to the time required on any individual piece of work, but also in proportion to the time required to attain the requisite knowledge and skill. A surgeon will sometimes richly earn in thirty minutes what it will take the ordinary laborer to earn in thirty days. A physician will make out a prescription in five minutes that has taken him five years to formulate. It is the same with all professional work.

But in the profession of dentistry there is much more expended for material than in other professions. It does seem very strange that the majority of people so hate to spend anything on their teeth, and always think their dental bills the largest of all bills, and go around seeking where they can get dentistry done the cheapest, regardless of quality. If they were to rightly consider the merits of such work they

would consider that where cheap work is done they generally get poor labor.

There are many things in life which consume our money foolishly, yet there is grumbling; while our teeth would only require, with good attention, from one to five dollars a year, if they were promptly and properly attended to. To verify this statement let a man sum up the amount spent on his teeth and divide by the number of years since he has had them to take care of; or let him call on a good dentist and ask what he will charge by the year to keep his or his family's teeth in good condition. It will be the easiest way to pay your dentist and the surest way of never having the toothache.

A Boy's Scientific Composition.—A boy fourteen years of age, recently imported from Kentucky, handed in the following as a composition on "Breathing." The instruction was, "Tell all you can about Breathing." He said: "Breath is made of air. We breathe with our lungs, our lights, our liver and kidneys. If it wasn't for our breath we would die when we slept. Our breath keeps the life a going through the nose when we are asleep. Boys that stay in a room all day should not breathe. They should wait till they get out of doors. Boys in a room make bad, unwholesome air. They make carbonicide. Corbonicide is poisoner than mad dogs. A heap of soldiers was in a black hole in India, and a carbonicine got into that there hole and killed nearly every one afore morning. Girls kill the breath with corsits that squeeze the diagram. Girls can't hollor or run like boys, because their diagram is squeezed too much. If I was a girl I'd rather be a boy, so I can hollor and run and have a great big diagram."—*Washington Star.*

Patients often break artificial teeth in the most unaccountable manner. Sometimes, however, they are honest enough to acknowledge that a tooth came off the plate while eating custard pie; or that, in sneezing, the plate dropt on a feather bed and broke in two pieces. We recently heard of a set of teeth being broken while the owner was reading a Sunday paper, he having, it is supposed, struck a chestnut. Volapük is particularly injurious to artificial teeth.—*Dental Advertiser.*

—Naomi—"Henry, there was no rain storm last night, was there?"

"None that I know of."

"Did you fall into the water?"

"Certainly not. Why?"

"I think papa must have been mistaken."

"What do you mean, Naomi?"

"He said you were terribly soaked last night."

Editorial.

SOME THINGS OF INTEREST IN PHYSIOLOGY.

We make no pretence to completeness in physiological description, nor to originality. We aim to give some facts which may be interesting and instructive to those who have not the time or the inclination to study anything more elaborate. We hope to give such a relish for more, that our readers will be obliged to satisfy themselves from other sources.

INHERENT WARMTH AND VOLUNTARY MOTION

Are, perhaps, the first phenomena observable as distinguishing animate from inanimate things.

In everything, motion produces warmth; but in inanimate bodies this warmth is not an inherent condition, nor is this motion a volition. In animals, warmth glows and motion is free, tho everything about them is cold and motionless. How this is so is not easily explained. Life and its activities are a mystery, and the character of the organization by which these are exhibited is too wonderful for our comprehension. Much is, however, known, and we will record, in a plain way, some of its more interesting features:

WE ARE A FURNACE OF FIRE.

The fuel we consume is not disposed of just as that put in the steam engine; yet it is not so different as might be imagined. In both, it is oxygen that produces combustion, by which the fuel is transformed into heat and motion. We have the resultant coal and ashes, with the carbonic acid gas as smoke. But there is this difference: whereas, in the engine, the fuel makes heat which is only transformed to motion, much of the fuel given to the body goes to make up internal growth. But even here the difference is not all it seems; for a man takes, say five pounds of food daily, and yet generally remains at about the same weight, instead of adding these five pounds daily to his avoirdupois. If he weighs himself just before a meal and then just afterward, he will find an additional weight; but by the time he becomes hungry this added weight will have all disappeared. Under some circumstances he may for some time increase in weight; but under other circumstances he will find himself growing lighter, tho he continues to eat.

Did you ever notice that if you shut the draft off your engine the fire will not burn? So it is with us. Unless we can have a free supply of oxygen from pure air we shall become cold and enfeebled, and soon die.

PHYSIOLOGY,

In its restricted sense, treats of the use and activities of living things,

while anatomy tells of their formation. In general treaties, however, the former includes the latter.

One would suppose the anatomy of the body would give a pretty good idea of the purposes and functions of its different parts; but it does not. A bone, studied without a knowledge of its physiological use, would be an enigma; and a muscle or a nerve, examined only with reference to its composition, would afford but a faint idea of its use.

ORGANIZATION.

Our whole body is called a system; this is made up of many organs. An organ is any part which has a specific use, as the heart, a muscle, a tooth, or a finger. An organized structure is distinguished from an unorganized substance by its being produced by the internal workings of its own activities. The great difference between cold anatomy and warm, pulsating physiology, is

LIFE.

No man has yet determined what life is; we can only see its effects. Life is not the result of organization, but organization the result of life. We may place non-living substance under circumstances ever so favorable for the production of life, and life will not come. It must have the germ of life inherent, and yet it is life from life, a mere continuation of life. Heat, light, electricity and chemism may produce changes dependent on their modifying influences and the juxtaposition of their particles, but they cannot bring forth life.

Living bodies increase in size by an internal

GROWTH,

While minerals accumulate particles by accretion—an increase from without. Living bodies have a limited existence of growth, maturity, and decline and death; minerals may remain unchanged indefinitely. All organized things are the product of parentage; the unorganized, of mere chemical affinities

Both organic and inorganic things are composed of what are called

ELEMENTS.

These are substances which seem to be simple, not compound; and which, therefore, we cannot resolve or divide into mere ultimate forms. A piece of chalk is not an element, because it can be divided into a rarified compound substance called carbolic acid gas, and a solid compound called lime. Gold is called an element, because it cannot be divided into a simpler form. Some substances, which in the past have been reckoned among the elements, are now found to be compounds. In the future, therefore, the present list of what are considered elements may have to be modified.

PHYSIOLOGICAL ELEMENTS AND RUDIMENTARY STRUCTURES.

There are computed to be over sixty elements in nature; but not a fourth of these compose the human body. Physical elements are derived from unorganized substances. Most of those in our bodies are first modified from inorganic substances by becoming components of vegetable organizations.

The ultimate beginning of animal substance is a mere speck, with out definiteness of shape or structure, yet having within it the elements of life, growth and propagation. The simplest form of this protoplasmic life is a wonderful tho minute nucleus, generally called a cell. These vary much in form and size, tho at best they are very minute. Some, such as the adipose or the starch cells, are small bags filled with fat, or statch, which are reservoirs of supply; others are disks, which flake or break up continually, and thus produce growth of the different component parts of the body by propagating their species. Others seem to be but specks of jelly. Out of these various forms, all the tissues of the body—the membranes, muscles, bones and organs in general—are formed. Different classes of cells, then, differ in character as well as in size and shape. They are composed of different elements, as they are designed for various compound organizations. Tho the body, therefore, is made of few elements—mainly carbon, hydrogen, oxygen and nitrogen, with iron, potassium, sodium, phosphorus and calcium—these do not enter into all parts of our organization alike. A divine wisdom guides their combinations to give great diversity of structure, and directs each to its proper place in definite proportions.

THE ORGANIC COMPOUNDS

Are principally albumen, a substance like the white of an egg; gelatin, or jelly-like compounds, as cartilage; oil and fat of the adipose tissue, and starch, with its sugary compounds, which are continually being converted into tissues. The first two contain nitrogen, hydrogen, oxygen and carbon. Fat and starch are rich in carbon, but lack nitrogen. Water—hydrogen two parts, oxygen one part (H_2O)—constitutes two thirds of the weight of the body, and is designed principally as a solvent for the substances which enter into its constituents and growth. The fat and the starch may be called reserved forces, as neither of these of themselves constitutes food. It is only as the fat is seized by the carbon to make fuel, and the starch is aroused into life by oxygen to produce sugar, that either become active elements of growth.

Ruskin tritely says: If you do not wish for Christ's Kingdom, do not pray for it; but if you do, you must do more than *pray* for it; you must *work* for ti.

DR. JOHN A. FOLLETT.

This eminent practitioner and teacher in dentistry, whose portrait we present in this issue, is Dean of the Boston Dental College. He is fifty-five years of age, right in the prime of life, and this "best of his life," he is giving to the advancement of that college, and the thorough instruction of its pupils. Being a graduate of medicine as well as dentistry, and thoroughly qualified in both, he is making himself felt as an educator, as well as a practitioner.

He was four years surgeon in the army, following Gen. Sherman in his memorable "march to the sea."

THE FLORIDA STATE DENTAL ASSOCIATION.

The sixth annual meeting of the Florida State Dental Association was held in the city of Oceola on the 10th and 11th of April.

Owing to a mistake in the time of meeting, there was a small attendance; but the sessions were exceedingly interesting.

The following officers were elected for the ensuing year:

President, Dr. C. B. Carver, St. Augustine; first Vice-President, Dr. L. M. Frink, Jasper; second Vice-President, Dr. R. D. Fuller, Oceola; Recording Secretary, Dr. J. C. Perinel Oceolo; Corresponding Secretary, Dr. F. L. Frink, Jasper; Treasurer, Dr. J. O. Hughes.

The next meeting will be in Jacksonville on the second Wednesday in April, 1890.

T. B. WELCH. PHILADELPHIA, April.

DEAR DR.:—The Class of 1889, Dental Department, University of Pennsylvania, tender you their sincere thanks for the kind favor extended toward them in sending the ITEMS OF INTEREST for the past term. Trusting that its mission will be appreciated by others as it has been by us, I have the honor to be yours, etc.,

G H. MAYER, Sec. 1889.

Elliot L. Douglass, D. D. S., of New Haven, Conn., of the Class of 1887, Pennsylvania College of Dental Surgery, died at Hong Kong, February 5th, 1889.

Dr. Douglas practiced in Kansas City about one year. On arriving in China he commenced practice in Pekin, but went from there to Hong Kong, where he was taken ill soon after he arrived.

The Louisville College of Dentistry opened January 27th, 1889, with a goodly number of students; the matriculants being twice as many as last year.

We feel encouraged with the way our College seems to be in favor, and hope next year to have even a larger number than are now enrolled.

The Infirmary has been supplied with three new chairs.—*Henry Pirtle.*

Miscellaneous.

THE WHALE.

The main physical characteristics of the whale are its distorted jaws, with upward directed nostrils, its great bulk and rudimentary limbs. The huge bulk of the creature is driven forward by the flexible caudal fin, and, while the body is rigid in front, it exhibits great mobility behind. The blow holes are placed on top of the head, and the animal, can only respire when these are above water. The larger whales travel at the rate of about four miles an hour, but, when pursuing their prey or goaded by pain, they rush through the water at a much greater pace. They are aided in this by the broad and powerful tail, which is their chief organ of locomotion. Instead of being vertical, as in the fishes, this is horizontal, and the larger species can command immense driving power. The tail is also used as an offensive and defensive weapon. The smooth, shinning skin is immediately underlaid by a thick coating of blubber, the great object of the whalers. This is at once dense and elastic, and, while it preserves the animal heat, it also serves to reduce the mighty bulk of the whale, and to bring it nearer to the specific gravity of the element in which it spends its existence. An interesting trait in the economy of the whale is the manner in which it suckles its young. In doing this, it partly turns on its side, and, the teats being protruded, sucking and breathing can proceed simultaneously. Naturalists divide the cetacea into two divisions, represented by the "whalebone" and "toothed" whales. In the former the teeth are replaced by a series of great plates of a horny nature, and these, depending from the palate, constitute the baleen—the whalebone of commerce. The laminæ which comprises this number, about 500, are ranged about two-thirds of an inch apart, and have their interior edges covered with fringes of hair. Some of these attain to a length of 15 feet. The cavity of a whale's mouth has been likened to that of an ordinary ship's cabin, and inside the surface conveys the idea of being covered with a thick fur. The soft spongy tongue is often a monstrous mass 11 feet broad and 18 feet long. It might be thought that the whale, with its vast bulk, would want sea creatures of a high organization to nourish it; but this is not so. Its chief food consists of minute mollusks—of medusæ and entomostraca—and with these its immense pasture grounds in the northern seas abound. In connection with these will be seen the beauty of the mouth's structure. "Opening its huge mouth," says Professor Huxley, "and allowing the sea water, with its multitudinous tenants, to fill the oral cavity, the whale shuts the lower jaw on the baleen plates, and, straining out the water through them, swallows the prey stranded upon its vast tongue."—*From the Saturday Review.*

A Million Dollar Telescope.—Representative Butler, of Tennessee, has introduced a bill in Congress to appropiate $1,000,000 to be expended, under the direction of the Secretary of the Navy, in the construction of a great telescope with a lens 60 inches, or 5 feet, in diameter. The diameter of the Lick object glass, the largest in the world, is 36 inches. In view of the fact that many astronomers re-

garded the success of the great Californian telescope as more than problematical, on account of the difficulty of casting and figuring such huge disks of glass, Mr. Butler's proposition is decidely startling. But it should be remembered that, thanks to the success of the Paris glass makers and the incomparable skill of our great American telescope makers, the Clrks, the Lick lens has turned out to be so perfect that the croakers have been silenced, and wonder has taken the place of doubt. While it would undoubtedly be an achievement that would tax to the utmost the skill and experience of the artisans and artists who should undertake the work, yet it cannot be said that the construction of a telescope object glass of 60 inches diameter is impossible.

Such a glass, if successfully made, would be a much greater improvement over the Lick telescope than that great instrument was over the largest of its predecessors. To show that it is only necessary to remember the light-gathering power of an object glass varies as the square of its diameter. The largest glass before the completion of the Lick lens was the 30-inch telescope of the observatory of Pulkowa. The light-gathering power of the Lick telescope is to that at Pulkowa about 13 to 9, or one and a half times as great; but the power of a 60-inch lens would be to that of the Lick telescope as 36 to 13, or nearly three times as great. Such a glass would be four times as powerful as the Pulkowa telescope.—*New York Sun.*

GLUCOSE.

The process of making glucose will be best understood by following the corn from the time it enters the factory until it runs out at the spigot, a clear, odorless liquid. The shell corn is first soaked for several days in water to soften the hull and prepare it for the cracking process. The softened corn is conveyed by elevators to one of the highest stories of the factory and shoveled into large hoppers, from which it passes into mills that merely crack the grains without reducing them at once to a fine meal. The cracked grain is then conducted to a large tank filled with rinsing water. The hulls of the corn float at the top of the water, the germs sink to the bottom, and the portions of the grain containing the starch, becoming gradually reduced to flour by friction, are held in solution in the water.

By an ingenious process both the hulls and the germs are removed, and the flour part now held in solution contains nothing but starch and gluten. This liquid is then made to flow over a series of tables representing several acres in area, and the difference in the specific gravity of the two substances causes the gluten and the starch to separate without the use of chemicals. The gluten is of a golden yellow color, and the starch snow white.

By the time the gluten has been completely eliminated the starch assumes a plastic form and is collected from the separating tables by wheel-barrowfuls and taken to a drying room, where it is prepared as the starch of commerce or is placed in a chemical apparatus to be converted into glucose. The conversion is effected by submitting the starch to the action of a minute percentage of dilute sulphuric acid, which, without becoming a constituent part of the compound, produces by its presence merely a miraculous chemical change. This change

from starch to glucose is a gradual process, and has four or five well-defined stages. On the addition of the acid the first change results in the production of what is known to chemists as dextrine. If at this stage the acid is neutralized by the addition of lime water, the process is choked and dextrine is the permanent product.

If the process is allowed to go on, the acid, however, works a second change, and maltose is the result. Here the process can, if necessary, be interrupted by neutralizing the acid by means of lime water, and for some purposes in the art of brewing this is sometimes done. The third and important stage in the chemical change wrought by the action results in the production of glucose, and just here is where the greatest skill of the chemist is required.

The product must show by test that it responds to the chemical formula C_6, H_{12}, O_6. By comparing this formula with starch, which is C_6, H_{10}, O_5—that is, six parts carbon to ten of hydrogen and five of oxygen—it will be seen that the sulphuric acid has not added to the starch, but has taken up two parts of hydrogen, and the only gain in starch is one part of oxygen. The lime water introduced to neutralize the acid forms with it a product called gypsum, which can be removed from the glucose without leaving any appreciable trace.

The fourth stage in the chemical process, results in crystalizing the liquid, and the product is called grape sugar. There is a fifth stage, in which caramel, or burnt sugar, could be produced were it of any commercial value. The gypsum, or sulphate of lime, formed by neutralizing lime water and sulphuric acid, sinks by gravitation to the bottom of the vessel and the supernatant saccharine liquid is drawn off from the top. This is almost pure chemical glucose; but it is still subject to a filtering process through bone black, and refined in the same way as cane sugar is refined. The bone black has anything but the appearance of a purifying agent, but possesses the peculiar property of attracting to itself all coloring matter.

The glucose, passing through a labyrinthine system of filtering, is drawn off through spigots in the lower part of the building, and is ready to be shipped away in barrels. To give the glucose the appearance of cane syrup, as well as to impart some of the characteristic taste, a small amount of that syrup is added to suit the fancy of the buyers.

To make grape sugar the glucose is dried in rapidly revolving vessels, from which much of the moisture escapes by virtue of the centrifugal force. Neither the glucose nor the grape sugar is used for domestic purposes, although either one is about two-thirds as sweet as the sweetest cane sugar. Glucose is chiefly used for fermenting purposes, and of late years has become valuable to the brewer in making beer and pale ales. It is also largely used in mixtures with cane syrups and molasses, and esteemed more wholesome than the cane product which is, at the best, only a side product or residue in the manufacture of sugar.—*Amer. Analyst.*

Quill toothpicks are made in large quantities in France. The largest factory in the world is near Paris, where there is an annual product of 20,000,000 quills. The factory was started to make quill pens, but when these went out of use it was turned into a toothpick mill.